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Popular Sketch of the Bath Mineral Waters and their uses.

By

Louis King, M.R.C.S.

SECOND EDITION.

S. W. Simms, Bookseller, Bath.

1884

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Popular Sketch

of the

BATH MINERAL WATERS

by

Louis King, *M.R.C.S.*

Senior Surgeon to the Eastern Dispensary, and Surgeon to Bath Ear and Eye Infirmary;

Author of "Principles of Health," "Work of Body, Work of Brain," etc.

WITH LATEST ANALYSIS OF THE WATERS BY J. W. GATEHOUSE, F.I.C.

Bath:

S. W. SIMMS, BOOKSELLER, 12, GEORGE STREET.

1884.

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Introduction.

I have endeavoured in this brief sketch of th
Bath Thermal Waters to place before the publ
in a concise form the history and application of th
only Hot Springs which our Island contains.

Statistics I have avoided as tedious, and readi
to be found in other and larger works on the su
ject.

My desire is to publish a popular rather tha
a purely medical treatise.

The public know but little of the value
Mineral Waters and their great curative powe
and as often expect cure in hopeless cases
neglect the use of means at hand, in such as wou
derive benefit.

LOUIS KIN

Rivers House, Bath.
1884.

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The Heat and Solvent Power of Mineral Waters.

Sit cisterna mihi, quam vinea malo Ravennæ
cum possim multo vendere pluris aquam.

MARTIAL.

WHEN we speak of Mineral Waters—I mean, when we apply that term to the vast number of wells and springs which have the reputation of possessing therapeutic effects, extolled frequently with great exaggeration—we are apt to forget that all water, which rises from the earth in springs, is really Mineral Water, inasmuch as it holds in solution certain saline or mineral matters. Water possesses wonderful solvent powers, and as it passes through the various strata of rocks and soils, takes up and holds in solution some part of the salts, etc., of which these strata are composed. In this it is aided by a decomposition, as

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a result of Time, of the chemical elements, or components of the strata through which it passes. In the case of Mineral Waters, as the term is generally understood, the amount of these constituents is very considerable, and coming, as these waters do, from great depths, they possess exceptional solvent powers by which larger quantities of salts are taken up and brought to the surface of the earth. The most important of these qualities is *heat*, another is the presence of carbonic-acid gas.

Many are the theories which have been suggested as to the origin of the heat present in so many of the Mineral Waters. Wild theories have been suggested, unsupported by true scientific basis—fermentation in the centre of the earth, subterranean conflagration of beds of coal or peat, converging stream of acids and alkalis, etc. etc.

We know that the centre of the earth is in a molten state, and that it finds relief in periodical volcanic eruptions. And it seems probable that the heat of Thermal Waters depends on this cause, coming as they do from a great depth. Besides, it has been demonstrated that the deeper we burrow into the earth the higher the temperature becomes.

It is suggested by astronomers and geologists that all planets are undergoing a process of cooling. In the first period their heat was intense, that then followed a period of initial cool-

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ing, in which a crust formed, that ultimately permitted vegetation and the existence of animal life, and finally, that a further process of cooling has led to an absolute coldness, which debarred the existence of vegetable and animal life, of which the moon is a type, and to which state our earth will ultimately arrive.

Another theory is that of rapid chemical change developing heat, of which we see an analogy in the contact of caustic lime and water, and various other chemical changes well known to science.

Yet another theory seems plausible, and is certainly in accordance with the phenomena of electricity. It is well known that if a current of electricity be passed through a conducting medium, and a medium of less conductive power interrupt the current, a high degree of temperature is generated. Of this we see an example in the white heat developed in a thin platinum wire, when interposed between the poles of a galvanic machine. This we may readily believe to be the cause of heat in Thermal Waters, when we remember that enormous currents of electricity are constantly passing through our earth, to which the different strata act as conductors of varying powers as media.

Whichever theory we hold, we must regard the interior of the earth as a vast laboratory, in which prodigious quantities of saline matters are being constantly formed. These are dissolved

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by the action of water, an agency which, as I have said before, is assisted by heat and carbonic acid gas, and are thrown up in almost unvarying quantities in the mineral springs scattered over the surface of the earth.

Carbonic acid, which is the result of chemical decomposition, aids materially the solvent power of water. And it is remarkable, how much more prevalent it is in the colder waters, than in those in which the solvent power is aided by heat. There are, of course, some Mineral Waters which derive their salts from strata so near the surface and so readily soluble, that neither heat nor carbonic acid is required for their solution. Of these we have instances in many of the sulphur springs, and in those containing sulphate of magnesia, etc. For the most part, the Mineral Waters of England are less rich in saline matters, as in carbonic acid and heat, than those of Germany and other parts of the world. They must not, however, be regarded on this account as of less curative value, since free dilution is now recognized as an adjunct to the therapeutic action of most saline remedies.

In England we possess only one Mineral Water which is characterised by any great height of temperature—that of Bath, which rises at a temperature of 117° to 120°. The chemical constitution of the water does not vary to any considerable extent, though it has been demonstrated by the periodical analyses, made

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about the year 1874 by Captain Mackay Heriot, that the amount of iron and chlorine in combination varies somewhat.

The discovery of the Hot Springs of Bath is shrouded with that mystery and uncertainty which surrounds so many heirlooms of prehistoric times. We are told by the earliest authorities that Prince Bladud was here cured of a leprosy by the accidental discovery of the hot springs.

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Legend of Prince Bladud.

Fies nobilium tu quoque fontium.

T a period which has been variously set down between 800 and 500 years B.C.—that is to say, ever so long ago, when Lud-Hudibras was King of Britain, he had a son called Bladud. Now, because he was heir to so great a throne, it was thought right that the young prince should receive the best education possible in those days. Accordingly, he travelled to Athens, to be instructed in all the learning of the schools. But at Athens a dreadful disease—the leprosy—seized on the young prince, and he came home only to be scouted by the Court and banished by his father. Poor Bladud must then be a swine herd, and watching his charge one day on Beechen Cliff, he saw them rolling in the marshes at its foot. And those that were with broken skin, and staring flank unseemly, came forth refreshed and smooth. Thereat the prince himself bathed in the warm stream that threaded the marsh, and was healed of his leprosy. Afterwards, when he was King, he built a city on the site of his marvellous cure.

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A more ambitious legend ascribes the foundation of the Baths to the year 863 B.C., and traces the family of King Bladud through Brutus, grandson of Ascanius, to Æneas. When the mother of Brutus, according to this account, was pregnant, an oracle declared that the son about to be born would kill his father and mother; and after travelling over many countries in banishment, would at last arrive at the highest pitch of glory. The first part of the prophecy was fulfilled, when the mother of Brutus died, in the agony of giving him birth: and the second, when accidentally he slew his father Sylvius, by an arrow in hunting. Banishment was the sentence for this parricide. Brutus fled into Greece, and there found the descendants of Helenus, one of the sons of Priam, held in slavery by the King of the Greeks. He put himself at the head of the bondsmen and defeated the Greek King, Pandrasus, who gave Brutus his daughter in marriage, and allowed the Trojans to leave Greece, loaded with presents. An oracle, received by Brutus in sleep, on the Island of Leogesia, directed him to a new kingdom—an island—once possessed by giants, where he was destined to raise a second Troy. Accordingly, after visiting the Tyrrhenian Sea and Aquitain, Brutus landed in the island which then bore the name Albion, and founded New Troy on the banks of the Thames. On his death the kingdom was divided among his three sons,

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Locrin, Abanact, and Kamber. After Locrin came Maddan, and after him Menpricius, whose son Brutus was called Greenshield, and reigned twelve years. Then the crown descended to Leil, who built Kaerleil at the same time King Solomon began to build the Temple of Jerusalem. Leil was succeeded by his son Hudibras, and Hudibras was the father of Bladud.

Now, Bladud was very skilful, and built Kaerbadus, and made hot Baths in it for the benefit of his people, and these Baths were dedicated to Athena. In the temple of Athena were fires that never went out, nor consumed to ashes, but were turned into balls of stone as soon as they began to decay. Bladud was also a necromancer, and taught magic in his kingdom. But at last he attempted to fly, and falling down on the temple of Apollo, in the city of Quinorantum, the King was thereby dashed to pieces.*

Leaving these wild legends, which depend on a tradition by no means reliable, we have wonderful evidences in the magnificent Baths, of Roman origin, which have recently been discovered, of the great value the Romans considered the healing properties of the Bath Waters. Sufficient has already been unearthed to demonstrate that there exists beneath our present bathing estab-

* For a more detailed account of King Bladud, the curious are referred to Wood's Essay, published in 1749.

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lishments a superb system of baths, which the luxurious tastes of the Romans established in our city. Enervated by luxury, and unsupported by the wealth of ancient Rome, the deserted Britons were unable to withstand the Saxon hordes that swept over the land, burning and destroying what they, a more hardy race, failed to appreciate. We have evidences of destruction by fire, and also that pillage was not the cause of the ruin of these noble structures. Of the first in the charred remains, and of the second in the fact that vast quantities of lead, which must have been of value even in Saxon times, are buried amongst the ruins.

Then came a period of desolation, when the wild-fowl built her nest and reared her young, and the wolf prowled amongst the broken columns and shattered arches that a few years before had echoed the glad voices of Roman legionaries. Another turn of the hour-glass, and the mantle of Time enveloped the broken column and the shattered arch, and the Saxon churl went to his daily toil amid the undulating hills and slow-running waters of the Avon, and heeded not the relics of by-gone splendour that lay beneath his wooden plough.

That this complete obliteration must have taken place is clearly shown by the fact that a new city rose immediately above the site of the former baths, and the hot springs bubbled up through an intervening stratum of earth that

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Time had deposited. Between the periods in which the Baths were employed by the Romans, with every appliance which could add to the comfort of a luxurious race, and the present time, when our world-renowned Baths, which are unrivalled in Europe for the perfection of their equipment, a pitiful vista is presented of neglect alike of comfort and of decency. We read of open baths, without any provision for the separation of the sexes; of the baths being the receptacle for the dead carcasses of animals; of such scenes of riot and brawling as the pencil of Hogarth might well satirize. It is not my object in this brief sketch to enumerate the various stages, very tardy in their progress, by which the Baths arrived at their present condition of perfection; I will refer my readers to larger works on the subject in which these matters are elaborately dealt with.

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Properties of the Waters.

"*Nullæ sic tibi blandientur undæ;*
Nec fontes Aponi rudes puellis,
Non mollis Sinuessa, fervidique
Fluctus Passeris aut superbus Anxur
Non Phœbi vada, principesque Baiæ."

N considering the curative effects of the Bath Waters, and indeed of Mineral Waters generally, we must remember that we have, in the first place, to combat that which at certain periods has been over-lauded. A tinge of empiricism retarded true scientific investigation, illumined by modern science. The benefits to be derived from the use of Mineral Waters were discovered, for the most part—I speak of the comparatively modern Waters; *for the use of our own Springs is prehistoric*—by empiricism. That is to say, that persons finding a Water which was peculiar in its character, tried its effects on various ailments, without any accurate knowledge of its constituents, and in the flood-tide of popularity, imagined that it would cure

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every ill to which the flesh is heir. Ludicrous mistakes have been made—old and forgotten cesspools have been drained, under the ægis of mistaken medical opinion; and less potent wells and springs have been unduly lauded in the enthusiasm begotten of each new discovery.

In the old days of alchemy, the search after the Philosopher's Stone and the Elixir of Life showed the tendency, deep-rooted in the instincts of man, to discover a remedy that should cure all disease and relieve all ills. This same tendency has prompted the indiscreet eulogy of Mineral Waters, which, were it well founded, would reduce the science of medicine to a simplicity and certainty that it is far from possessing. If waters were a panacea, then there would be no need of doctors.

Though I propose giving in detail the curative action of the various ingredients of the Bath Mineral Waters, it must not be forgotten that subtle combinations are prepared in the laboratory of Nature which defy the highest powers of chemistry to imitate; and experiment shows us that artificial imitations of the salts of Mineral Waters, and the employment even of the salts obtained by the evaporation of the waters themselves, is disappointing in its results as compared with their action when in their primary solution as presented to us from the "lap of earth."

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The Curative Action of the Bath Waters.

Non ego paucis offendar maculis.

THE Bath Mineral Water is not only a thermal or hot water, but contains such mineral matters as would entitle it also to be styled an Alkaline and Chalybeate Water. Its alkaline character adds materially to its value in its external application, in the treatment of numerous diseases ; and the presence of iron, in such a form and under such circumstances as favour rapid absortion, gives results in the treatment of diseases of an anæmic or bloodless type, that are in the highest degree satisfactory. There is another advantage in this triple combination of heat, alkali, and iron. The use of many alkaline waters cannot be long continued, owing to their lowering action on the system, when iron waters are resorted to, to correct that influence. Again, the continual use of iron waters is undesirable, owing to their constipating effect, and other waters have to be substituted, or some form of drug taken to correct this. No such necessity, in either of these particulars, exists in the case of the Bath Water.

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Efforts have, at different times, been made to introduce various medicinal substances into the waters. Some of these were most extraordinary and by no means appetising. Crab's-eyes, coral, and pearls, and even soap, are amongst the most preposterous of these addenda: while the profession were in the habit also of prescribing medicinal substances, such as spirits of nitre and preparations of iron, in the hope of assisting the curative action of the waters. These additions have ceased to be employed in Balneo-therapeutics. It is now generally considered that Dame Nature does her own work best in her own way.

The depressing influence which is sometimes felt after the ordinary hot bath, is not felt in the use of these waters, and we are continually being told by patients that a feeling of exhilaration and tonicity is experienced, often to their surprise, after the employment of the mineral bath.

The Bath Mineral Waters hold in solution—as will be seen in the appended Analysis of Mr. Gatehouse :—

Calcium,
Magnesium,
Potassium,
Sodium,
Lithium,
Iron,
Sulphuric Acid,

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Chlorine,
Silica,
Strontium,

and besides these Carbonic Acid; to which, together with heat, much of the solvent power is due, and a considerable amount of nitrogen.

On exposure and cooling, the free carbonic acid is dissipated, and a portion of the iron, etc., becomes deposited in an insoluble form. The presence of the Saline matters is of advantage, in supporting and maintaining the temperature of the water, and also from the fact that many of the alkaline salts are capable of absorption by the skin. It has been suggested by some authors that the Bath Waters retain their heat for a longer period than plain water heated. This is probably true, and for the reason I have just stated, but cannot be ascribed, as has also been suggested, to the peculiarity of the heat latent in them; because in numerous experiments which I made I found that although Mineral Water retained its heat rather longer than plain water, the former when allowed to cool on being re-heated by artificial means, took precisely the same time to cool as a volume of Mineral Water drawn from the spring at the same temperature and placed side by side with it.

Early writers, whose chemical knowledge of the constitution of the Waters was less exact than our own, were in the habit of prescribing a

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course of the Waters from the different springs in succession. But we now consider the springs so nearly identical in action and effect on the system that no such precaution is considered necessary.

The sides of tanks and reservoirs in which successive volumes of water have been allowed to cool become incrusted with a furred deposit, resembling petrified moss. Glasses and other objects immersed in the water, after a few months, are coloured with a brown stain from the same cause.

Lime (Calcium) is present in considerable quantities in our Waters. It enters into the composition of almost every tissue of the body, and very largely—as much as 65 per cent.—into the formation of bone. It has a powerfully alkaline, that is antacid, action. Lime is, therefore, probably, one of the great curative agents in the external application of the Waters. In combination with Chlorine, for a long time Calcium held a high position as a remedy in scrofulous diseases. Lime, in the form of Carbonate, has a soothing and antacid effect, and is useful in those cases of dyspepsia arising from irritability of the mucous membrane.

Magnesium also enters into the composition of our bodies, and is found in bone and other structures. When combined with Chlorine or with Sulphuric Acid it has a laxative effect, and very possibly is one of the means by which the

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usually constipating influence of an ordinary Chalybeate Water, is avoided in the instance of the Bath Water. Magnesium is also a powerful antacid.

According to Dr. Weber, Sodium, in combination with Carbonic Acid, is a most important constituent of the human body. Oxidation and tissue-change seem to be greatly influenced by the presence of soda; various proteinacous bodies seem to be kept in solution by it; it has a considerable share in the secretion of saliva and bile, and in the digestive processes; and, according to Liebig, it acts as a vehicle for the carbonic acid from the blood to the lungs.

Carbonate of soda may be considered as an antacid, as a diuretic, as a promoter of tissue-change, and as a solvent.

Now, although the per centage of sodium in the Bath Waters is a small one, Dr. Weber remarks, "The beneficial effects of alkalis are, in general, produced only by a systematic use of small doses; whilst large quantities cause, by their excessive solvent effect, emaciation, and by their depressing influence on the heart's action, diminish the tissue-change."

Chlorine, in combination with soda, is met with more abundantly in the blood; chlorine, in connection with potassium in the muscular tissue; but both are generally diffused through the fluids and tissues of the body. Their uses

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are various. They aid in keeping the albuminoid principles in solution, and greatly help absorption. They assist in the development and growth of the body; an instance of the necessity of the chlorides to life is the instinctive appetite in animals for salt.

The following is a condensation from the Medical Annual of Vienna, for 1868:—

"Sodium chloride effects the absorption and storing up of iron in the blood; while chloride of potassium denudes the iron-holding tissues and eliminates the iron from the system. Thus, then, the former, combined with iron-salts, will help to fill the veins with healthy blood; while the latter may either retard the construction of new red corpuscles or hasten the disintegration of others."

Here, again, we may notice the just graduation of the scale of Nature, for the proportion of sodium to potassium, in the composition of the Bath Waters, is more than 3 to 1.

Silica is one of the constituents of the tissues of the epidermis. It is found, occasionally only, in the blood, bile, and urine, and therefore needs no detailed mention here.

The position of Iron as a curative agent is too well-known to need a detailed description. Iron acts as a general tonic, and is fully appreciated as an invaluable remedy in reviving the worn-out fibre of the heart;

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while it is a necessary ingredient of the blood. Traces of iron may be found in almost all tissues and fluids of the body: yet, in spite of this omnipresence, the total quantity of iron in the system is so small that the minute proportion contained in the Bath Waters is even in excess of what Nature requires for the repair of structure.

The proportion of other Minerals known to be present in the Waters is so small as to require no remark.

It would be tedious to enumerate the chemical changes, or metamorphoses of tissue, which depend on the absorption of such salts as contain Chlorine, Sulphur, Lime, Potash, Soda, and Iron, all of which are present in the Bath Thermal Waters.

Supposing a glass of the Bath Water to be drunk, as it ought to be, at as high a temperature as possible, and soon after it has been drawn from the spring, (by which means no time is allowed for the deposition of any portion of the Iron, and evaporation of the Carbonic Acid which holds it in solution,) the first effect on the stomach is that derived from the hot alkali water. The blood-vessels of the stomach become enlarged, and absorption commences, under circumstances likely to ensure its being rapidly performed. A feeling of exhilaration, a slight increase in the pulse, and, in unsuitable cases, a sense of fulness about the

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head is experienced. Some persons are particularly sensitive to this exhilaration, which is due, I think, to the iron being rapidly absorbed. After removing the iron from a portion of the water, I re-warmed it, and administered the Water without any exhilarating effect following. The patient was not aware of the experiment. I have repeated this in the case of one or two susceptible persons with the same result. It is evident, however, if we consider the presence of some quantity, at least, of gastric juice in the stomach, that certain chemical changes, or interchange of chemical elements, should take place. The absorption of saline matters from the stomach and other parts of the alimentary canal is very rapid. It is carried on by a process called osmosis. This is a process by means of which saline matters, albumen, and other elements of nutrition are taken up by the tissues of the body.

Although chemical analysis can do but little to account for the beneficial effects of Mineral Waters, as we are unable by analysis to discover the exact combinations which exist—the cross combination of salts; and, above all, the peculiar circumstances of heat, etc., which have aided in their solution; nevertheless, this *seriatim* examination of the constituents of the Bath Waters may be of use in enabling us to appreciate, to some slight extent, the value of its different components. Our Waters contain

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some ingredients which have an established position as remedies constantly employed in Therapeutics. And there are, besides these, others which formerly held a well-merited position as possessing curative properties, but which have fallen into desuetude owing to the introduction of more quickly active, though probably less sure remedies. Again, there are certain Salts which are of importance in the nutritive processes which take place in the body; some which take part in building up and nourishing the tissues; others which assist the process of nutrition, enabling it to be carried on with greater regularity, and in a manner that entails less waste.

I have stated that Mineral Waters possess a special curative action which no artificial combination of the laboratory has been able to imitate. Another most important source of their efficacy is the high degree of dilution in which the Salts they contain are taken, which aids materially in encouraging the absorption into the system.

Besides the fluid which comes through our arteries and veins, in the form of the vital fluid—blood—which is pumped by the heart into almost all parts of our bodies, carrying with it nourishment and life; there is also another form of circulation constantly taking place within us, by which vast quantities of fluid are continually passing through our

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system. This circulation may be said, in a measure, to be independent of the blood; for although the fluids which constitute it proceed directly from the blood, the channels through which they flow are extra-vascular; that is to say, not blood-vessels. The late Professor Parkes has pointed out the immense importance of this subsidiary circulation, and the vast quantity of fluid, distinct from the blood, that is secreted daily. He estimates the amount of gastric juice, that passes daily into the stomach, at between twelve and twenty-three pints in twenty-four hours. There are, besides, the secretions of the pancreas, the salivary glands, and the bile, computed at something like seventeen pints for the same period; while the amount contributed from the mucous membrane of the intestines can only be conjectured. It may thus be seen that the quantity of fluid daily effused exceeds the quantity of blood in the whole body.

All these fluids are richly loaded with salts which are very valuable. For they are necessary to the nutritive process in the system, and bring about the various changes in used-up and effete tissues, by which their elimination is ensured. Then, too, by their means, the various departures from health, due to the retention in the system of these effete matters, are prevented.

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The Waters Applied Outwardly.

Puræ rivus aquæ.

I WILL preface this portion of my subject by an enumeration of the following fundamental effects of Warm Baths, simple as well as mineralised, as stated by Dr. Hermann Weber:—

"1.—That they soften and purify the skin more rapidly than cold Baths, and prepare it for perspiration.

2.—That they equalise and diminish the loss of heat, and according to the temperature of the Bath, lessen and prevent it altogether; and that in the hot Bath, heat is even added to the body.

3.—That the circulation in the skin is accelerated.

4.—That the organic functions and the tissue-change are slightly stimulated, or rather facilitated, without any strong reaction on the part of the organism.

5.—That the nervous system and muscular irritability are calmed.

6.—That the absorption of exudations is promoted."

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There are various modes of employing the Bath Mineral Waters in outward applications. Such are Baths of different temperatures; the simple, or dry douche, by which a large volume of water is projected on to an affected part; the wet douche, which is a jet injected under water while the patient is immersed in the ordinary bath; the vapour bath; and localised packing. The Mineral Water is also sometimes used in the form of enemata, with advantage.

In early days much preliminary treatment, of a character often more energetic than skilful, was deemed necessary for the patient before entering on a course of baths. Very little treatment is considered essential in our day, supposing a case suitable for such a course. A quarter-of-an-hour is generally long enough for a first bath at a temperature of 98°, and it is often recommended that one day should intervene before a second bath is taken. The course may then be continued on successive or alternate days, as advised; the temperature of the bath being gradually raised as the treatment may require, and the duration of the bath extended. This extension should not exceed half-an-hour, unless specially recommended; though in olden times patients frequently remained in the bath for hours together.

There are certain conditions of constitution which render it unwise for those affected by

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them to bathe. They are—valvular disease of the heart; most forms of epilepsy; cases of paralysis in which the hœmorrhage or effusion on the brain is of recent date; and certain other conditions of disease which will be easily recognized by the medical attendant, who should invariably be consulted before a course of the Waters is commenced. In such cases as these local bathing, without entire immersion of the body, may safely be had recourse to. Many persons experience a slight feeling of dizziness on first entering the bath, sometimes attended by slight palpitations. These, with the reservations made above, are only transient symptoms, and generally disappear after the second bath.

Some persons are very tolerant of the mineral baths, and I once had under my care a determined old gentleman, aged 75, who took two baths daily, for fourteen days in succession, omitting only the Sundays, with most satisfactory results, though he had been almost crippled with rheumatism during four previous months.

Patients frequently expect too much from a course of the Waters, and expect it too quickly. Good results do not always follow immediately. It has been known even that patients have left Bath, after a course of the Waters, without relief, to find lasting benefit awaiting them at home. The course, according to circumstances, should extend from six weeks to two or three months. Some find a yearly return to Bath,

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and a repetition of the treatment, beneficial in many chronic forms of disease. The cases which are generally considered most satisfactory are those in which a slow and gradual improvement is noticed after a few baths. The chronic forms of disease are those usually treated by the Waters; but although this is the case, we from time to time see instances in which acute attacks of Gout, etc., have been relieved. I had such a case under my care, in which the cure might almost be called accidental, since it was, as far as I know, unprecedented, and resulted from a complete defiance of all advice. It was that of a young gentleman, aged 20, who consulted me one evening, for an acute attack of Gout, which he derived hereditarily, and had fostered by his own intemperance. I prescribed the usual remedies, and called to see him on the following morning, when I found that he had gone out for the purpose of taking a Mineral Bath. He continued taking a bath daily at a high temperature, and answered my remonstrances by assuring me that if it did not cure him it might kill him, which latter contingency he thought quite as satisfactory as continued endurance of the pangs of Gout. The course of Waters may be taken at any period of the year, though it is generally considered advantageous to avoid the extreme heat of summer and the extreme cold of winter.

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The Medical Application of the Waters.

Te spes et albo rara Fides colit velata panno.

DRINKING the Waters was formerly carried on in a much more wholesale manner than it is at present. We are told by early writers, of many quarts being drunk on several days in succession. It is the custom now, to take only one glass of the water during the day, at first; subsequently this quantity may be increased to two or three. It is usual to take the waters after the bath; but the separate employment of bath and waters has been of the greatest use in many forms of disease.

Absurd empiricism—absurd, as judged by the principles of modern science and the light it has thrown upon the real merits of the Waters—brought discredit on the Baths. A remedy which was ridiculously lauded as curing all forms of disease, was naturally regarded with suspicion by the learned, and ceased for a time to meet with the appreciation it really deserved.

Balneo-therapeutics have been purged of many of the errors which once surrounded

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them ; and the great remedies offered us by Nature, in the form of Mineral Waters, under more discriminating advocacy, are now held in high estimation. We possess, in Mineral Waters generally, and perhaps in none more markedly than the Bath Thermal Waters, powerful aids to medical science ; powerful for good when skilfully applied, but none the less powerful for evil if abused.

The disorders which are remedied by the use of the Bath Waters are Dyspepsia, Gout, Rheumatism, Sciatica, Neuralgia, Paralysis, Nervous Debility, many forms of Skin Disease, and, last but not least, Anæmia, or poverty of blood.

As my object in these pages is to give a popular treatise on the subject of the Bath Waters rather than a purely medical one, I will content myself with describing, briefly, the class of cases likely to derive benefit from their use, in order that sufferers may judge, in their own instance, whether a visit to Bath may or may not be advisable. Many cases of Dyspepsia of a chronic form, and associated with irritability of the mucous membrane, derive great advantage from drinking the Waters, if persevered with for two or three months.

The forms of Gout which are most benefitted are those of a suppressed and sub-acute character, in which the disease fails to relieve itself by external manifestation. Bathing, judiciously

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regulated as to temperature, often affords ultimate relief, by bringing on an external attack of a more acute character.

Patients suffering from disease in this form should remember that the process of cure is often attended by what appears to them, at first, an augmentation of their disease.

Rheumatic affections of the joints, which are the result of pre-existing inflammatory disease, or what is called chronic osteo-arthritis, are much assisted; and the swelling and stiffness of the joints are relieved, if treatment is commenced at a sufficiently early period, and before marked structural changes have taken place.

The list of cures effected by the Waters is rich in cases of Sciatica and Neuralgia, in which the use of the Bath, the Douche, and the under-water Douche, have produced speedy and lasting alleviation.

Helpless cripples, terrible instances of blighted humanity, are brought to Bath buoyed up by the hope of recovery, though their maladies depend on such deep-rooted structural change that they are beyond the reach of cure. The cases of paralysis, many of which derive considerable benefit, are those in which the lesion of a nerve-centre—as, for instance, the pressure of a clot on the brain—has yielded to treatment; while there yet remains the muscular atrophy, or wasting from disease, and the stiffness of limb.

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These symptoms are greatly relieved by bathing, associated with movement, friction, and shampooing; while the internal use of the Water affords a mild tonic, of which such cases are very tolerant.

Nervous Debility is very frequently much relieved.

Skin-Disease in many forms, obstinate and unyielding to treatment, often gives way to the emollient influence of bathing and packing, and the internal employment of the Waters.

I think, however, there are no cases which afford more satisfactory results, under treatment by the internal use of the Waters, than those of Anæmia, or bloodlessness, whether it owes its origin to derangement of the uterine functions, to hyperlactation, to residence in a hot or unhealthy climate, or to excessive rapidity of growth, or is the result of some debilitating disease.

In such cases, nature has provided us with a blood-food, iron, in a form in which it is easily and rapidly assimilated, owing to the salts that accompany it, the heat of the Water, and the chemical alteration that takes place as it is brought in contact with the gastric juices.

It is probably owing to these circumstances that the irritability which frequently accompanies the exhibition of iron, in the case of young children, is not present when the Bath Waters are taken. The intolerance, also, which old

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people often manifest is not experienced when iron is administered by means of the Bath Mineral Waters. An ingenious adaptation and wholesome beverage is the Sulis Water, a preparation in which the æration of the waters, by Carbonic Acid, enables it to retain the iron and salts that would otherwise be deposited. This valuable invention puts it in the patients' power to continue the use of the Waters, in a most palatable form, after leaving Bath.

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Bath as a Residence.

Ille terrarum mihi præter omnes angulus ridet.

Ὄλβιος οὗτος ἀνὴρ ὃς ἐμὸν δόμον ἐσκαταβαινει.

WE are so frequently told that a large share of the advantage which accrues from a course of Mineral Waters depends on a change of scene and the healthy character of the watering-place, that I think, in conclusion, it will not be out of place to enumerate a few of the advantages which are possessed in so large a degree by our city, which has rightly been named the Queen of the West.

It would be difficult to select a place of residence which, in its immediate neighbourhood, possesses such natural beauties, and, at the same time, such a variety of elevation and aspect. On the hills around Bath—Lansdown and Combe Down—the air is particularly bracing, and the porous nature of the sub-soil is such as to encourage a rapid absorption of surface-moisture. In the terraces and crescents and villa-residences on the slope of the Lansdown hill, and also in those on the surrounding and opposite hills, every variety of aspect can be secured. During the meeting of the Medical

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Association, held at Bath a year or two ago, a London physician, in large practice, expressed himself as having been very much struck by this variety of climate and aspect. We drove together to various parts of the city and its immediate environs, and he told me that he was quite converted from the opinion which he had often heard expressed, that Bath was a relaxing place; because, though mild and warm in the valley and lower part of the town, the atmosphere on the hills was particularly bracing.

The number of old people residing in Bath is exceptionally large. Great numbers of children sent home from India or other places of warm climate find here a congenial residence; while invalids, attracted hither, partly by the reputation of our Waters, partly by a climate, whose vicissitudes are less marked than they are elsewhere, find here alleviation of their maladies, and are less likely to suffer fatigue. Notwithstanding the fact that the aged, the very young, and the invalided—classes in which the rate of mortality must be exceptionally high—form a large proportion of the population of Bath, the lowness of its death-rate compares favourably with that of cities of similar magnitude in the United Kingdom.

The houses are unusually well built, more particularly in the older crescents, squares, and streets. The thickness of their walls renders them cool in summer and warm in winter. The

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system of drainage is satisfactory, and moreover subject to the constant supervision of able and energetic officers.

In conclusion, I may mention that our superb system of Bathing Establishments is probably without equal in Europe; and that, thanks to the bountiful nature of our water-supply (385,000 gallons daily), there is no stint in the pure element for those frequenting our Baths; while a glance through the long list of names inscribed in the Visitors' Books draws attention—first, to the perfection of the management; second, to the courteous attention and skill of the attendants; third, to the generous appreciation of the public, and the many cures effected by the use of the Bath Thermal Waters.

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ANALYSIS OF THE BATH MINERAL WATERS,

By J. W. GATEHOUSE, F.I.C.,

Public Analyst to the City.

Lime - - -	CaO	44.240	grains per gallon.
Sodium - -	Na	13.500	„ „ „
Potassium - -	K	3.100	„ „ „
Ammonia - -	NH_3	0.195	„ „ „
Ferric oxide -	k_2O_3	.860	„ „ „
Magnesia - -	Mgo	6.500	„ „ „
Sulphuric acid -	SO_3	71.483	„ „ „
Chlorine - -	Cl	20.581	„ „ „
Nitric acid - -	N_2O_5	1.082	„ „ „
Carbonic acid -	CO_2	4.205	„ „ „
Silica - -	Sio_2	2.800	„ „ „

There are distinct traces of Strontium and Lithium, with minute traces of Rubidium and Iodine.

The Oxide of Iron and Silica both appear to be in the colloidal form, and as such are in a condition eminently favourable to absorption in the system.

Signed, J. W. GATEHOUSE.

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"There is nothing new under the Sun."

Sulis Water

IS THE

BATH MINERAL THERMAL WATER

(OF ROMAN ANTIQUITY),

Carbonized.

WHILE retaining all its Medical Qualities, it is by Aëration rendered one of the most Delicious, Palatable, and Invigorating SPARKLING TABLE WATERS, and whether used in the far-famed Queen of the West (Bath), e Pyramids of Egypt, or any other part of the habitable Globe, "SULIS Water" be drunk with the same amount of efficacy, imparting to all Health, Strength, Vitality.

Professor Attfield's Analysis and Medical Opinions and Treatise can be obtained of the SOLE LESSEE under the Bath Corporation.

Price List for Sulis Water:

0 GLASS BOTTLES	... ...	27/- per Case	7/- per Dozen.
0 DITTO HALF-BOTTLES	...	42/- ,,	5/6 ,,
0 DITTO QUARTER-BOTTLES		32/- ,,	4/- ,,

Cases and Bottles included.

eturned Empties.—Sulis Water Bottles only will be allowed for as follows:
50 LARGE GLASS BOTTLES, 3/-; 100 HALF Ditto, 4/6;
100 QUARTER Ditto, 4/-.

R. B. CATER, Sole Lessee,

The Springs, Grand Pump Room,

BATH.

Agents throughout the World

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